

ABSTRACT OF THE DISCLOSURE

The invention provides four
butyrylcholinesterase variants having increased cocaine
5 hydrolysis activity as well as the corresponding encoding
nucleic acids. The invention also provides libraries
comprising butyrylcholinesterase variants having at least
one amino acid alteration in one or more regions of
butyrylcholinesterase and further having at least one
10 butyrylcholinesterase variant exhibiting enhanced cocaine
hydrolysis activity compared to butyrylcholinesterase.
The invention further provides methods of hydrolyzing a
cocaine-based butyrylcholinesterase substrate as well as
methods of treating a cocaine-induced condition.